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Notes on *Carex*—VIII

KENNETH KENT MACKENZIE

CAREX STRICTA LAM. AND ITS ALLIES

Probably the only species of *Carex* growing in the vicinity of New York, which is abundant enough to make it the distinctive feature over large areas, is the tussock sedge, *Carex stricta* Lam. Every swamp is full of the great clumps of this plant, usually very largely to the exclusion of everything else. It is with difficulty that proper herbarium specimens can be made, as the root-stocks are very heavy and stout. In fact an axe or heavy spade is needed to dig out characteristic specimens. The result is that herbarium specimens are mostly very poor and usually consist of the culms broken off as close to the ground as possible.

The distinguishing features of this common plant are its habit of forming dense tussocks (or bogs in the vernacular sense), its not being loosely and strongly stoloniferous, its intensely deep green leaves, triangular or channelled at the base, usually light brown culm bases, and but slightly hispidulous sheaths. It is a very rough plant, the perigynia are strongly granular roughened, and the scales are usually light reddish brown tinged.

Another species which is widely distributed throughout the northeastern United States can be readily told in the field, but much less easily from the usual run of herbarium specimens. This plant grows in great beds and does not form tussocks. It produces many long horizontal stolons; the leaves, at first glaucous green, in age become light green or blue green, and contrast strongly with the leaves of *Carex stricta*, when growing near it; the culms at base are brown-purplish tinged, the sheaths are strongly hispidulous, and the scales vary from blackish to dark reddish brown in age, while the leaves are flat or nearly so to the base. The perigynia are slightly more beaked than in *Carex stricta*, and the lowest bract is noticeably larger. This species is *Carex strictior* Dewey. It has often been mistaken for *Carex*

aquatilis Wahl. by discriminating collectors, who have noticed that it was distinct from *Carex stricta*, and who could find no other name apparently available for it.

By far the most widely distributed species of this group in the eastern part of the United States, is a plant to which I am applying the name *Carex Emoryi* Dewey. This is a freely stoloniferous plant growing in beds like *Carex strictior*. It, however, is a much stouter plant, and the basal sheaths are not filamentose or hispidulous. The perigynia, which are abruptly and prominently short-beaked, are smooth under an ordinary lens except towards the apex and much resemble the perigynia of the *C. aquatilis* group. This species ranges from New York, western New Jersey and Maryland to Manitoba, Colorado and New Mexico, and has at various times been referred to *Carex stricta* or *Carex aquatilis*.

A slender species of this group with a northerly range is *Carex Haydeni* Dewey. This plant has broadly oval or suborbicular perigynia which are noticeably inflated and light brownish at maturity, in these characters being readily separable from other members of the group here discussed. The scales always exceed the perigynia and the spikes are small in size. While the culms are cespitose they are much less densely so than in *Carex stricta*. As far as I can make out the habit of growth is much like that of *Carex torta*, i. e., the plant has very short ascending stolons. The basal sheaths are often, but not always, entirely free from the filamentose fibers so evident in *Carex stricta*, and the culms are usually much darkened at the base.

The first three species referred to above all vary to a very considerable extent in the size of the pistillate spikes. Specimens with very short spikes, referable to *Carex strictior*, have been described as *Carex stricta* var. *curtissima* Peck. Such specimens have the perigynia very crowded, and on this account the perigynia not having a chance to properly develop often present a different appearance from specimens where they are less crowded. I regard these plants only as exhibiting individual peculiarities, and do not believe they should be given varietal recognition.

These same three species also often produce slender elongated pistillate spikes. Such specimens have of late years been going under the name *Carex stricta* var. *angustata* (Boott) Bailey, and

very narrow spiked forms have been called *Carex stricta* var. *xerocarpa* (S. H. Wright) Britton. However, the original *Carex angustata* Boott, on which the variety *angustata* is founded, is a plant from the Oregon-Washington region, and is entirely distinct from the eastern species. The narrow spiked specimens of the eastern plants do not seem worthy of recognition.

While it is not my intention in this paper to consider all the Pacific Coast species which are closely related to *Carex stricta*, I have included *Carex angustata* and certain plants confused with it. *Carex angustata* itself is distinguished from its eastern relatives by the finely many-nerved perigynia. It seems to be exactly the same plant afterwards described by Professor Bailey as *Carex acutina* and is of rare occurrence in collections. It is a slender plant with rather loosely cespitose culms and short ascending stolons. The lowest bract does not exceed the inflorescence, the lower sheaths are nearly if not entirely smooth, and the foliage is much less rough than in its eastern relatives.

More common in the same region is a much larger plant which has often been distributed as *Carex acutina* Bailey. In it the lowest bract much exceeds the inflorescence and the lower sheaths are strongly hispidulous. This species seems not to have been described and accordingly I am now proposing it as *Carex egregia*.

The plants from the eastern parts of the Rocky Mountains called *Carex acutina* seem to be either forms of *Carex aquatilis* Wahl. (*C. variabilis* Bailey), having sharp pointed scales exceeding the perigynia, or species closely related to it. They are but distantly related to the genuine *Carex acutina*.

The species here treated are separable as follows:

- | | |
|---|----------------------|
| Culms very densely cespitose, forming bogs; short ascending stolons or long horizontal stolons not conspicuously developed. | <i>C. stricta.</i> |
| Culms loosely cespitose, in clumps or beds; short ascending stolons or long horizontal stolons freely developed. | |
| Loosely cespitose; with short ascending stolons. | |
| Perigynia broadly oval or suborbicular, inflated, brownish at maturity (eastern United States). | <i>C. Haydeni.</i> |
| Perigynia narrower, plano-convex, not inflated (Oregon and Washington). | |
| Lowest bract exceeded by inflorescence; lower sheaths smooth. | <i>C. angustata.</i> |
| Lowest bract exceeding inflorescence; lower sheaths hispidulous. | <i>C. egregia.</i> |

Forming beds; long horizontal stolons numerous.

Lower sheaths filamentose; perigynia granular-roughened, green; culms slender to base; lower sheaths little septate-nodulose.

C. strictior.

Lower sheaths not filamentose; perigynia granular-roughened towards apex only, straw-colored; culms stout at base; lower sheaths strongly septate-nodulose.

C. Emoryi.

CAREX STRICTA Lam. Encycl. 3: 387. 1789

"*Carex acuta* L." Muhl. Descr. Gram. 263. 1817.

Carex virginiana Smith, Rees' Cycl. 7 sp. 100. 1819.

Carex commutata J. Gay, Ann. Sci. Nat. II. 11: 198. 1839.

Carex Kelvingtoniana Steud. Syn. Pl. Cyp. 215. 1855.

Carex virginica Steud. Syn. Pl. Cyp. 217. 1855.

Carex tenuispica Boeckl. Flora 39: 225. 1856.

Carex tristicha Boeckl. Flora 41: 651. 1858.

Carex xerocarpha S. H. Wright, Am. Journ. Sci. II. 13: 334. 1866.

Carex angustata var. α *typica* and var. β (in great part) Boott, Ill. Car. 4: 173. pl. 586, f. 1, 587. 1867. Not *C. angustata* Boott; Hooker Fl. Bor. Am. 2: 218. 1867.

Carex angustata var. *xerocarpha* Bailey, Carex Cat. 1884.

Carex stricta var. *angustata* Bailey; A. Gray, Man. Ed. 6, 600. 1890.

Carex stricta xerocarpha Britton, Bull. Torrey Club 22: 222. 1895.

Growing in very dense tussocks, the culms aphyllopodic, 3-10 dm. high, slender, strict, exceeding leaves, very rough on the sharp angles, the faces concave, strongly filamentose and brownish or light purplish brown at base, the basal sheaths subcarinate. Leaves with well-developed blades three to five to a fertile culm, on lower fourth, often somewhat clustered, the sheaths slightly hispidulous, tight, hyaline and often brownish tinged opposite the blades, the blades 1.5-3 mm. wide, usually 1-3 dm. long, stiffish, deep green, the margins revolute, but blade itself channeled and keeled towards base, strongly roughened. Principal staminate spike usually one (with one or two smaller sessile ones near its base), erect, peduncled, 2-4 cm. long, 2.5 mm. wide, the scales oblong-obovate, obtuse, light reddish brown with lighter center and hyaline margins. Pistillate spikes usually two or three, erect, sessile, or lower slightly peduncled, more or less strongly separate, the upper often staminate above, the better developed 2-6 cm. long, 3-5 mm. wide, the perigynia closely arranged in several ranks (or spikes at times somewhat attenuate below);

bracts sheathless, their auricles inconspicuous, slightly dark-colored, the lower bract 1.5–3 mm. wide, shorter than inflorescence; the upper reduced. Scales variable, oblong-obovate to lanceolate, obtuse to acuminate, reddish, with lighter center and narrow hyaline margins, narrower and usually rather shorter than perigynia, appressed. Perigynia broadly to narrowly ovate, closely enveloping achene, plano-convex, not inflated, two-edged, granular-roughened, punctulate, dark green, obscurely few-nerved dorsally, nerveless ventrally, 2.5 mm. long, 1.5 mm. wide, rounded and substipitate at base, short-tapering to the beakless or nearly so subentire whitish-tipped apex, the style short-exserted; achenes lenticular, broadly ovate, substipitate, 1.75 mm. long, 1.25 mm. wide; stigmas two.

SPECIMENS EXAMINED

MASSACHUSETTS: Cambridge, *Fernald*, June 10, 1891 (C.); Cambridge, *Underwood 2644*, May 9, 1891 (C.); Boston, *B. D. Greene* (C.); West Roxbury, *Forbes*, June 8, 1911 (K.M.).

RHODE ISLAND: Providence, *Olney*, June 8, 1871 (N. Y., C.); Providence, *Olney*, labeled *C. strictior* Dewey (C.).

NEW HAMPSHIRE: base of White Mountains, *Tuckerman* (C.).

NEW YORK: Bull's Head, Staten Island, *Britton*, June 2, 1889 (C.); Grant City, Staten Island, *Britton*, May 26, 1889 (C.); Suffern, *Schrank* (C.); West Hampton, *Delafield*, June 13, 1888 (C.); Junius, *Sartwell 54* (N. Y., C.); Prattsburgh, Steuben County, *Wright* (N. Y., C.), type of *C. xerocarpa* S. H. Wright; Philips-town, *Barratt* (C.); New York, *Torrey* (C.).

NEW JERSEY: Plainfield, *Tweedy*, June, 1884 (C.); Woodbridge, *Lighthipe*, May 3, 1890 (C.); Manchester, *Torrey* (C.); Pitman, Gloucester County, *Long 3425*, May 16, 1910 (P.); Farmingdale, *Long & Brown 3644*, May 28, 1910 (P.); Glassboro, Gloucester County, *Long 3360*, May 14, 1910 (P.); Delair, Camden County, *Long 3353*, May 10, 1910 (P.); Cape May Court House, *Long 7229*, June 1, 1912 (P.); Delanco, Burlington County, *Long 3466, 3467*, May 19, 1910 (P.); Cold Spring, Cape May County, *O. H. Brown*, June 26, 1911 (P.); Mickleton, *Crawford*, May 10, 1892 (P.); Kaighn's Point, Camden County, *MacElwee*, May 7, 1892 (P.); Batsto River, Burlington County, *Bassett 45*, May 25, 1912 (P.); Quinton, Salem County, *Long 3029*, April 22, 1910 (P.); Cranberry Lake, Sussex County, *Mackenzie 1294*, May 30, 1905 (K. M.);

Netcong, Morris County, *Mackenzie* 3167, June 21, 1908 (K. M.); Lakehurst, Ocean County, *Mackenzie* 4546, May 15, 1910 (K. M.); South Amboy, *Mackenzie* 1223, May 21, 1905 (K. M.); Charlotteburg, *Mackenzie* 3083, May 24, 1908 (K. M.); Chatham, *Mackenzie* 174, May 30, 1903 (K. M.); Greenwood Lake, *Mackenzie* 2567, May 19, 1907 (K. M.); Delaware, Warren County, *Mackenzie* 5354, May 10, 1913 (K. M.); Landisville, *Gross*, 1872 (P.); Camden, *Boice*, May 16, 1878 (P.).

PENNSYLVANIA: West Chester, *Pennell* 1333, May 29, 1909 (P.); Frazier's bog, Montgomery County, *Long* 3354, 3356, May 12, 1910, and 3773, June 1, 1910 (P.); Tullytown, *Crawford* (P.); Corning, Lehigh County, *Pretz* 5422, May 30, 1913 (P.); Willistown, Chester County, *Stone* (P.); East Nantmeal Township, Chester County, *Pennell* 2817, June 14, 1911 (P.); Oxford, *Crawford*, June 8, 1892 (P.); Williamson, Delaware County, *Pennell* 3770, June 23, 1912 (P.); Allentown, *Pretz* 4703, June 28, 1912 (P.); Tullytown, *Keller*, June 12, 1897 (P.); Nottingham, Chester County, *Pennell & Long* 3700, June 22, 1912 (P.); Chester County, *Pennell* 3910, June 27, 1912 (P.); Penn Valley, *Crawford*, May 7, 1899 (P.); Nockamixon, *Crawford*, June 30, 1893 (P.); Penn Valley, *Crawford*, June 1, 1899 (P.); York County, *Glatfelter*, May 30, 1895 (K. M.); Penn Valley, *Pretz*, June 30, 1899 (P.); Centre Square, *Brinton*, May 20, 1892 (P.); Nockamixon, *Crawford*, June 30, 1893 (P.); Chester County, *Pennell* 1398, May 30, 1909 (P.); Lancaster, *Carter*, May 24, 1904 (P.); Stacy's Hollow, *Wister* 46, June 3, 1862 (P.).

DELAWARE: Ashland, *Commons*, June, 1865 (P.); Greenbank, *Commons*, May 26, 1879 (P.).

ILLINOIS: Canton (*C. xerocarpa* S. H. Wright).

TENNESSEE: Jackson, *Bain* 489, May 15, 1893 (C.).

CAREX HAYDENI Dewey, Am. Journ. Sci. II. 18: 103. 1845
Carex β *erecta* Dewey, Am. Journ. Sci. 10: 265. 1826.
 "Carex *aperta* Boott" Carey; A. Gray, Man. 547. 1848.
Carex aperta var. β Boott, Ill. Car. 4: 132. *pl.* 426. 1867.
Carex aperta var. *minor* Olney, Exsicc. V. 15. 1871.
Carex stricta var. *decora* Bailey, Bot. Gaz. 13: 85. 1888.
Carex stricta var. β *Haydenii* Kükenth.; Engler, Pflanzenreich
 4²⁰: 330. 1909.

Cespitose, the culms slender, 3 mm. thick near base, 5-10 dm. high, aphyllopodic, sharply triangular and strongly roughened on the angles above, usually much exceeding the leaves, the fertile slightly or not at all filamentose at base. Leaves with well-developed blades two to four to a fertile culm, on the lower fourth but not bunched, the sheaths papery and yellowish- or whitish-hyaline ventrally, smooth or nearly so, the blades flat with slightly revolute margins, about 2.5 mm. wide, usually 1-2 dm. long, very rough towards the apex; sterile culm leaves longer. Terminal spike stimate (usually with an additional sessile smaller one at base), linear, 2-4 cm. long, 3 mm. wide, the scales oblong spatulate, obtuse to acutish, reddish brown with lighter center and hyaline margins. Pistillate spikes two or three, erect, sessile or nearly so, approximate or a little separate, linear, 1.5-3 cm. long, 4-5 mm. wide, occasionally staminate at apex, scarcely attenuate at base, the perigynia very numerous, in few rows, spreading-ascending; bracts sheathless without dark colored auricles, the lowest 2 mm. wide, normally exceeded by inflorescence; the upper much reduced. Scales ovate or lanceolate, long acuminate to acute, narrower than but strongly exceeding perigynia, from dark brown to straw color, with lighter center and hyaline margins. Perigynia light brownish at maturity, flattened biconvex, broadly oval to suborbicular, two-edged nerveless or obscurely few-nerved, 2-2.5 mm. long, 1.25-1.75 mm. wide, membranaceous and slightly inflated, punctulate and resinous dotted, minutely granular towards apex, round-tapering at base and apex and abruptly very minutely (0.2 mm. long) beaked, the orifice hyaline, entire or emarginate. Achenes lenticular, substipitate, apiculate, yellowish, with orbicular faces, 1 mm. long; style exserted; stigmas two.

This species has in times past been confused with *Carex aperta* Boott, a phyllopodic species from the Columbia River region. Although frequently treated as a variety of *Carex stricta* Lam., one cannot help feeling that this is due to lack of knowledge of the two species. They are really thoroughly distinct species, and I have seen no evidence of any tendency to intergrade.

SPECIMENS EXAMINED

NEW BRUNSWICK: Bathurst, *Fowler*, August 4, 1874 (N. Y.).

MAINE: Bangor, *Knicht*, June 27, 1905 (K. M.); Bangor, *Mackenzie* 3188, July 3, 1908 (K. M.); Orono, *Harvey*, August, 1891 (N. Y.); Orono, *Fernald*, June 28, 1890 (C.); St. Francis, *Fernald* 135, August 5, 1893 (C.).

NEW HAMPSHIRE: Keene, *Gilbert*, June 11, 1877 (N. Y.).

MASSACHUSETTS: Dedham, *Forbes*, June 15, 1904, and June 9, 1914 (K. M.); Waverley, *W. Boott*, June 30, 1853 (N. Y.); "Mass.", *Davis* (C.).

RHODE ISLAND: *Olney* (C.).

NEW YORK: North Elba, *Peck* (N. Y.); Amherst, *Sartwell* (N. Y.).

NEW JERSEY: Lawrence, Mercer County, *S. Brown*, May 28, 29, 1904 (P.).

PENNSYLVANIA: Sellersville, Bucks County, *Pollard*, June 2, 1899 (K. M.); Sellersville, *Pretz*, June, 1883, May 16, 1896, and June, 1899 (P.); Plumsteadville, "*J.C.M.*", June, 1866 (P.).

ILLINOIS: Fountaindale, *Bebb*, 1870 (N. Y.); "Ill." *Vasey* (N. Y., C.).

MINNESOTA: Milaca, *Sheldon*, June, 1892 (C.); Nichols, *Sheldon*, June, 1892 (C.).

IOWA: Fayette, *Fink*, June, 1895 (N. Y.); St. Petersburg, *Parry* (C.).

MISSOURI: Lake City, Jackson County, *Mackenzie*, May 23, 1897 (K. M.).

NEBRASKA: "Nebraska Ter.", apparently duplicate of type (C.).

CAREX ANGUSTATA Boott; Hooker, Pl. Bor. Am. 2: 218. 1840

Carex angustata Boott (in part), Ill. Car. 4: 173. pl. 586, f. 2. 1867.

Carex acuta Bailey, Proc. Am. Acad. 22: 86. 1886.

Carex acutina Bailey, Mem. Torrey Club 1: 52. 1889. Not

"*Carex acutina* Bailey", Holm. Am. Journ. Sci. 16: 34; or Kükenthal; Engler, Pflanzenreich 4²⁰: 319.

Loosely cespitose, with short ascending stolons covered with brown scales, the culms 3-6 dm. high, strongly aphyllopodic, slender, 3-4 mm. wide at base, 1.5 mm. above, exceeding the leaves, roughened above on the angles, brownish reddened and more or less filamentose at base. Leaves with well-developed blades usually three to five to a fertile culm, on the lower third, the blades light green ascending, flat to base with slightly revolute margins, smoothish beneath, 2.5-3 mm. wide, 1-4 dm. long, much roughened towards the attenuate apex, the sheaths smooth, membranous, easily breaking and slightly yellowish tinged ventrally. Staminate spike usually one, from little to strongly rough-peduncled, 2.5-5 cm. long, 3-5 mm. wide, the scales oblong-

obovate, obtuse, brownish-black with lighter center and slightly hyaline margins. Pistillate spikes three to five, erect, more or less strongly separate, the upper sessile, the lower short-peduncled, linear-cylindric, 2-4 cm. long, 3.5-5 mm. wide, the upper especially often staminate at apex, the lower slightly attenuate at base, the numerous perigynia ascending, closely packed in several ranks; lower bract leaflet-like, shorter than or sometimes nearly equalling inflorescence, sheathless; upper bracts shorter; auricles often darkened, the upper at least dilated. Scales oblong-ovate to lanceolate, obtusish to acuminate, narrower and from somewhat shorter to somewhat longer than perigynia, blackish with lighter center and slightly hyaline apex. Perigynia straw-colored, obovoid or oval, sessile or nearly so, two-edged plano-convex, finely many-nerved or nerveless when young, 3 mm. long, 1.5 mm. wide, glandular-punctulate, slightly granular towards apex, not serrulate, round-tapering at base, abruptly apiculate, beaked, the beak 0.25 mm. long, with entire black-tipped orifice. Achenes lenticular, sessile, with obovate faces, 1.5 mm. long; stigmas two.

SPECIMENS EXAMINED

OREGON: Deschutes River, *Howell* 935, May 9, 1885 (N. Y., H.); Sauvie's Island, *Howell*, May 15, 1886 (N. Y.); "Oregon" 1883 (H.).

The original specimens of *Carex angustata* Boott were collected along the Columbia River in Oregon or Washington by Scouler and Tolmie. Later Dr. Boott, failing to notice that these specimens represented a different species than the eastern *Carex stricta* Lam., applied the name *Carex angustata* to the eastern plant. His reason for not taking up the name *Carex stricta* Lam. was that there was a common European species known as *Carex stricta* Good., and he believed that this name having come into common use should not be superseded by *Carex stricta* Lam., even though the latter was the earlier published name. His views on this point have, however, not prevailed, but later botanists in taking up the name *Carex stricta* Lam. have continued the confusion by tacking on the name *Carex angustata* to it as a slender-spiked variety, and have disregarded the real identity of this species.

Carex acutina Bailey has also been the source of much unnecessary confusion. The original comparison was with the European *Carex acuta*, an aphyllopodic species, and the original

specimens collected by Howell quite justify such a comparison. Later botanists have created confusion by applying the name to certain phyllopodic species related to *Carex aquatilis* Wahl. More justifiable was the confusion with the species immediately hereafter described.

***Carex egregia* sp. nov.**

Loosely cespitose and short stoloniferous from slender creeping rootstocks, the culms 4.5–9 dm. high, 4.5 mm. wide at base, 1.5 mm. wide below spikes, slender but erect, sharply triangular with concave sides, slightly roughened above, exceeding leaves, strongly purplish tinged at base, aphyllopodic. Leaves with well-developed blades three or four to a fertile culm, on lower fourth, somewhat bunched, the blades flat to base with revolute margins, roughened towards apex, 2–3 mm. wide, usually 1–3 dm. long, the sheaths hispidulous, little carinate and sparingly septate-nodulose dorsally, and brownish tinged ventrally. Terminal spike staminate, stalked, 4 cm. long, 5 mm. wide, the scales obovate, obtuse, purplish black with white midvein not extending to apex. Lateral spikes four or five, the upper one or two small, staminate, the lower two to four pistillate (often staminate at apex), more or less strongly separate, sessile or short-peduncled, 2.5–4.5 cm. long, 5 mm. wide, with very many appressed-ascending perigynia in several many rows. Lowest bract leaf-like, exceeding inflorescence, sheathless, dark tinged at base, the upper bracts reduced, not conspicuously dark-auricled. Scales lanceolate, acute, purplish black with white midvein, narrower and longer or shorter than perigynia. Perigynia plano-convex, obovate, 3 mm. long, 1.5 mm. wide, finely about three- to five-striate on both faces, brownish, punctulate and granular-roughened, the margins sharp-nerved, not round, rounded and substipitate at base, rounded and abruptly minutely apiculate at apex, the orifice entire. Achenes lenticular, closely filling lower part of perigynia, brownish, 1.5 mm. long, substipitate, obovate; stigmas two.

Closely related to *Carex eurycarpa* Holm, a species with "rounded" perigynia, finely many-nerved on both faces and with more prominent emarginate beak. The type specimen was distributed as that species.

SPECIMENS EXAMINED

OREGON: Cascade Mountains, *Cusick* 2989, August 27, 1902 (N. Y., H.); Cscan Mountains, *Cusick* 2757, August 14, 1901

(H.); Silver Creek, Lake County, *Cusick* 2729, August 7, 1901 (N. Y., H.); Summit of the Cascades, *Cusick* 2991, August 14, 1902 (N. Y., H.).

WASHINGTON: Falcon Valley, *Suksdorf* 5181, July 15, 1905 (K. M., type).

IDAHO: Forks of St. Mary's River, *Leiberg* 1174, July 6, 1895 (N. Y.).

CAREX STRICTIOR Dewey; A. Wood, Class Book 582. 1845

"*Carex stricta* Good." Dewey, Am. Journ. Sci. 10: 269. 1826.

Carex Watsoniana Steud. Syn. Pl. Cyp. 215. 1855.

Carex angustata var. γ and var. β (in small part) Boott, Ill. Car.

4: 173. pl. 588. 1867.

Carex stricta var. *curtissima* Peck; Howe, Rep. N. Y. State Museum 15. 1895.

Cespitose, growing in beds (not in dense tussocks), freely long-stoloniferous, the culms aphyllopodic, 3.5-9 dm. high, erect, slender, sharply triangular, 3.5 mm. wide at base, 1.5 mm. above, very rough above, purplish tinged at base, exceeding leaves, the basal sheaths hispidulous, strongly filamentose. Leaves with well-developed blades three or four to a fertile culm, the blades at first glaucous-green or in age light green, revolute margined, flat to base, 2.5-3.5 mm. wide, mostly 2-4 dm. long, the margins very rough, the sheaths strongly yellowish-brown tinged ventrally. Terminal spike staminate, strongly peduncled, linear, 2-3 cm. long, 3 mm. wide, the scales oblong-obovate, obtuse, purplish-black with lighter center and narrowly hyaline margins. Lateral spikes mostly three, pistillate, approximate and sessile or nearly so, or the lowest often remote and slender long-peduncled, linear, 4-5 mm. wide, 1.5-3 cm. long, with very many ascending perigynia, closely (or at base more loosely) packed in several ranks. Lowest bract leaflet-like, about length of culm, sheathless; the upper much reduced. Scales lanceolate or oblong-lanceolate, obtuse or acute, narrower and from slightly shorter to slightly longer than perigynia, purplish black or in age deep reddish brown with lighter center. Perigynia plano-convex, ovate, closely enveloping achene, light green, granular-roughened, punctulate, reddish dotted, obscurely few-nerved, 2.25 mm. long, 1.5 mm. wide, two-edged, not serrulate, rounded and sessile at base, abruptly very minutely beaked, the orifice entire. Achenes lenticular, light brown, oblong-obovate, 1.75 mm. long, 1.25 mm. wide, minutely apiculate, the short slender style tardily deciduous; stigmas two.

The original description of this species by Dewey in Wood's Class Book is not satisfactory and it is easy to understand why subsequent botanists have failed to recognize the plant. It is as follows:

"Staminate spikes 1-2 with oblong and blackish acutish glumes; pistillate spikes 2-3, cylindric, staminate above, and hence acutish, lowest short pedunculate; perig. ovate, compressed, acute, glabrous, entire at the orifice, early falling off, glabrous, a little longer than the oblong and acute glume; st. a foot and more high, triquetrous and rough on the angles, with reticulated filaments connecting the leaves towards the base; lvs. erect, close; whole plant glaucous, except the spikes.—Wet places, common."

In 1826, however, in his articles on caricography he had described two closely related plants, one of which he called *C. acuta*, and the other of which he called "*Carex stricta* Good." His description of the latter (Am. Journ. Sci. 10: 269) is an excellent description of the plant I am now treating as *Carex strictior* Dewey. After a thorough technical description, in which he speaks of the nearly black pistillate scales and filamentose sheaths, he says, "color of the plants, except the spikes glaucous green," and ends up with the following:

"This species, found in England and Sweden, was first recognized in our country, by Mr. Schweinitz. It has probably been confounded with *C. acuta*, which it much resembles. There can be no doubt however that it is a distinct species. Though it grows in similar situations with *C. acuta*, it does not form a *bog*, but spreads over the surface of the marsh. It differs from that species too in its color, in the appearance of its spikes, in its more stiff and erect form and in its fruit being *caducous*" [italics Dewey's].

It will be noted that the points emphasized by him are the same points emphasized in his description of *Carex strictior* (*supra*), namely, color of plant, "more stiff" form, "strictior," and "caducous" or "early falling off" perigynia. His *Carex strictior* grows in wet places and no mention is made of its growing in bogs (i. e., dense tufts).

Again while he included a description of *Carex stricta* in Wood's Class Book he did not emphasize any of the points emphasized by him in 1826, and he speaks of the plant being found in "wet

places, as bogs." What then apparently happened is that in the interval between 1826 and 1843 Dewey found out that his original "*Carex stricta* Good." was different from that European species. So he made up a new name to apply to his plant, namely *C. strictior* Dewey. And at the same time he applied the name *Carex stricta* to our common densely tufted species.

As bearing out these views as to the identity of *Carex strictior* it is to be noted that in the 1863 edition of Wood's Class-Book Dewey added to his description of *C. strictior*, the words, "Nearer *C. caespitosa* than *C. stricta*," his *Carex caespitosa* being the strongly stoloniferous, bed-forming *Carex Goodenovii*.

Dewey's own herbarium does not aid very much. It contains four specimens kindly lent me by Professor Fernald. Three of these, collected and distributed by Sartwell, represent the species I take to be *C. strictior*. The fourth specimen collected by Olney is a specimen of *Carex stricta* Lam. Similar specimens collected by Sartwell and Olney are in the Torrey herbarium at the New York Botanical Garden.

The fact that this species is distinct from *Carex stricta* has been noted by a number of botanists. Thus, on a specimen in the Philadelphia Academy collected in 1892 by Mr. Benjamin Heritage, we find him noting it as "a form that does not grow in tufts, but is stoloniferous." Mr. Bayard Long in 1910 collected it at Frazier's Bog, near Philadelphia, noting its difference in habit of growth; and Mr. E. P. Bicknell and Dr. Wm. H. Wiegmann have both collected it around New York as *Carex aquatilis*, which in manner of growth it much resembles. And correspondence with Dr. E. H. Eames and Mr. F. F. Forbes has resulted in specimens from them both from plants which they had previously seen were distinct from *Carex stricta*.

The specimens listed below are to be referred to this species. Some are so poor that their identification has been difficult.

SPECIMENS EXAMINED

MAINE: Veazie, *Knight*, July 15, 1905 (K. M.); Fort Kent, *Mackenzie* 3436, 3424, 3427, July 11, 1908 (K. M.); 3663, July 23, 1908 (K. M.); Somesville, Mt. Desert Island, *Rand*, June 24, 1891 (C.); Foxcroft, *Fernald* 231, June 25, 1895 (C.).

NEW HAMPSHIRE: Muik Pond, Lisbon, *Graves*, June 9, 1893 (C.); base of White Mountains, *Oakes* (N. Y., C.).

MASSACHUSETTS: Chapman, no data (C.); Williamstown, no data (C.); Tewksbury, *Forbes*, June 7, 1911 (K. M.).

RHODE ISLAND: Providence, *Olney*, June 8, 1871 (K. M.); Cat Swamp, Providence, *Collins*, June 19, 1892 (C.).

CONNECTICUT: Easton, *Eames* 8743, June 3, 1914 (K. M.).

ONTARIO: Thedford, Lambton County, *Dodge*, June 22, 1911 (K. M.).

NEW YORK: Penn Yan, *Sartwell* (one in N. Y. Herb. and three specimens in Dewey Herb. and one in W. Boott Herb., H.); Van Cortlandt, *Bicknell*, June 1, 1890 (C.); Wellesley Island, Jefferson County, *Robinson & Maxon* 28, June 28, 1902 (N. Y.); *Torrey*, no data (C.); Junius, *Sartwell* 55 (N. Y.); Junius, *Sartwell*, labeled "*Carex aquatilis*" (C.); N. Y., *Crawe* (C.); Litchfield, *Hunt*, June 1873 (N. Y.); Herkimer County, *Haberer*, June 24, 1882 (C.).

NEW JERSEY: Mickleton, *Heritage*, June 5, 1892 (P.); New Egypt, *J. H. Grove*, May 21, 1905 (P.); Repaupo, *Crawford*, June 15, 1893 (P.); Lindenwold, *Githens*, June 28, 1902 (P.); Lawrence, *Mackenzie* 5868, 5874, May 31, 1914 (K. M.); Oak Ridge, *Mackenzie* 3185, 3182, 3186, June 28, 1908 (K. M.); Hoboken, *A. Brown*, 1877 (C.); "New Jersey" *Knieskern* 57, as *Carex salina* Wahl.? (C.); Manchester, *Knieskern* (C.).

PENNSYLVANIA: Mountainville, Lehigh County, *Pretz* 319, May 30, 1907, 429, June 22, 1907 (P.); Springfield, Bucks County, *Pretz*, June 1886 (P.); "Marshall road" *C. E. Smith*, May 21 (P.); Penn Valley, Bucks County, *Crawford*, June 1, 1899 (P.); Allentown, *Pretz* 49, May 18, 1901, 5503, June 17, 1913, 1238, June 11, 1908 (P.); Sellersville, *Crawford*, June 11, 1899 (P.); Slatington, *Bachman* 2085, May 13, 1911 (P.); Frazier's Bog, Willow Grove, Montgomery County, *Long* 3771, 3767, 3768, 3774, 3769, June 1, 1910, 9434, June 7, 1914, 3355, May 12, 1910; Byberry, *Martindale*, June 1865 (P.); Tinicum Meadows, Delaware County, *B. H. Smith*, May 30, 1898 (P.); Lowhill, Lehigh County, *Pretz* 4677, June 23, 1912 (P.); Lehigh County, *Krout*; Easton, *Porter*, July 8, 1890 (C.); Long Pond, Monroe County, *Britton*, June 24, 1895 (C.); Bucks County, *Pretz*, May 30, 1899 (P.).

DELAWARE: Centreville, *Commons*, May, 1864, and June 14 1868 (P.); Greenbank, *Commons*, May 27, 1879, and May 1, 1882 (P.); May 26, 1879 (var. *curtissima*) (P.).

MARYLAND: Conowingo, Cecil County, *Bartram & Long 1250*, June 1, 1913 (P.).

NORTH CAROLINA: Hendersonville, *Biltmore Herb. 1818a*, May 27, 1898 (K. M., N. Y.); Highlands, *Biltmore Herb. 4990b*, June 5, 1897 (N. Y.); Mitchell County, *Ashe*, May (N. Y.); Macon County, Buckley (C.).

TENNESSEE: Thompson's, *Ruth 978*, May, 1894 (N. Y.).

MICHIGAN: Port Huron, *Dodge*, May 30, 1911 (K. M.); Grand Rapids, *Miss Cole*, May 16, 1898 (K. M.); Emerson, Chippewa County, *Dodge*, June 16, 1914 (K. M.); Buchanan, *Deam 14195*, May 29, 1914 (K. M.); Vermilion, Chippewa County, *Dodge*, June 21, 1914 (K. M.); Olivet, *McClatchie*, May 24, 1888 (N. Y.); Lake Superior, *Pitcher* (C.); Hubbardston, *Wheeler*, June 25, 1890 (C.).

OHIO: London, *Sharp*, 1910 (N. Y.); "ad ripas Ohionis," *Lesquereux 551* (N. Y.).

WISCONSIN: Milwaukee, *Hasse*, May 27, 1882, and June 3, 1883 (N. Y.).

ILLINOIS: Winnebago County, *Bebb*, 1870 (C.); Chicago, *Moffat 88*, June 24, 1893 (N. Y.).

IOWA: Charles City, *Arthur* (C.).

NEBRASKA: "Nebraska" no data (C.).

CAREX EMORYI Dewey, Bot. Mex. Bound. 230. 1858

Carex virginiana var. *elongata* Boeckl. Linnaea 40: 432. 1876.

Carex stricta var. *Emoryi* Bailey, Proc. Am. Acad. 22: 85. 1886.

Carex acuta var. Reverchon's distr. Texan Pl. 1407; Bailey, l. c. 1886.

"*Carex stricta* Lam." Mackenzie & Bush, Fl. Jackson Co. Mo. 49. 1902.

"*Carex stricta* var. *angustata* (Boott) Bailey", Mackenzie & Bush, l. c. 1902.

Carex milligrana Holm, Am. Journ. Sci. 17: 311. 1904.

Loosely cespitose, growing in beds, with long slender root-stocks, the culms aphyllopodic, 4-10 dm. high, erect, 6-8 mm.

wide at base, slender, sharply triangular and from strongly roughened to nearly smooth above, exceeding leaves, purplish tinged at base, the basal sheaths smooth, not filamentose. Leaves with well-developed blades usually three or four to a fertile culm, on lower fourth, but not clustered, the blades light green, ascending, somewhat nodulose, flat to base with slightly revolute margins, much roughened towards apex, 3-5 mm. wide, 1.5-4 dm. long, the sheaths very membranaceous ventrally, slightly yellowish tinged. Terminal spike staminate, strongly peduncled, linear, 2-4.5 cm. long, 4 mm. wide, the scales oblong-spatulate, obtuse or acutish, brownish with broad lighter center and hyaline margins. Lateral spikes four to six, the upper one or two staminate, the lower pistillate or often staminate at apex, erect, sessile or the lower short-peduncled, linear, 2-10 cm. long, 4-6 mm. wide, with very many ascending perigynia closely (or at base more loosely) packed in several ranks. Lowest bract leaflet-like, from about equalling to exceeding culm, sheathless; the upper much reduced. Scales lanceolate, obtusish, short-acute or acuminate, scarcely 1 mm. wide, narrower and from somewhat shorter than to strongly exceeding perigynia, light or purplish brown with broad lighter center falling with the perigynia. Perigynia plano-convex, ovate or obovate, closely enveloping achene, at first light green, soon straw-colored, slightly granular-roughened towards apex, puncticulate, somewhat reddish dotted, few-nerved dorsally, 2-2.5 mm. long, 1.5-1.75 mm. wide, two-edged, not serrulate, rounded and sessile at base, abruptly apiculate-beaked, the orifice whitish, entire. Achenes lenticular, oblong-quadrate, substipitate, 1.5 mm. long, 1 mm. wide, minutely apiculate, the short slender style tardily deciduous; stigmas two.

SPECIMENS EXAMINED

NEW JERSEY: Scudders Falls, *Mackenzie* 5062, June 9, 1912 (K. M.); Red Bank, Gloucester County, *Parker*, June 6, 1872 (K. M., P.); Delaware, *Mackenzie* 4998, May 30, 1912 (K. M.); Crosswicks Creek, *Mackenzie* 5809, May 21, 1914 (K. M.); Coopers Creek, *Parker*, July 14, 1868 (P.); Camden, *Parker* (P., C.); Swedesboro, *Lippincott*, May 30, 1892 (P.).

PENNSYLVANIA: Bethlehem, *Schweinitz*; York Furnace, *Stone*, May 30, 1907 (P.); Penn Valley, *Crawford*, June 12, 1895 (P.); Tinicum, *Saunders*, May 20, 1898 (P.); Tinicum Township, *Saunders*, June 19, 1897 (P.); Penn Valley, Bucks County, *Crawford*, June 1, 1899 (P.); Kintnersville, *Van Pelt*, June 19, 1905

(P.); Narrowsville, *Lippincott*, May 30, 1893 (P.); Chester County, *Canby* (H.); Fort Washington, Montgomery County, *Long*, June 11, 1909 (P.).

DELAWARE: Hollyoak, *Commons*, June 6, 1866 (P.).

MARYLAND: Frederick County, *Aikin* (C.).

DISTRICT OF COLUMBIA: *Steele*, May 18, 1908, and May 12, 1902; *Vasey*, 188-.

INDIANA: Carmel, *Mrs. Deam 10548*, May 9, 1912 (K. M.); Cedarville, *Deam 14280*, June 14, 1914 (K. M.).

ILLINOIS: *J. Wolf*, no data (K. M.).

MANITOBA: Brandon, *Macoun 13357*, June 8, 1896 (N. Y.).

IOWA: Marshalltown, *Ball 381*, May 15, 1897 (K. M.); Council Bluffs, *Nicollet*, 1845 (C.).

MISSOURI: Greenwood, *Bush 6708*, May 20, 1912 (K. M., N. Y.); Monteer, *Bush 2896A*, May 17, 1905 (K. M.); Courtney, *Bush 6730*, May 28, 1912 (K. M.); Courtney, *Bush 6755, 6758*, June 2, 1912 (K. M.); Independence, *Bush 703*, May 23, 1894 (K. M., C.); Greenwood, *Mackenzie*, May 9, 1897 (K. M.); Buckner, *Bush 6762, 6776* (N. Y., K. M.), June 5, 1912 (K. M.); Lake City, *Mackenzie*, May 23, 1897 (K. M.); Sarcouxie, *Palmer 3706*, May 19, 1912 (N. Y.); Independence, *Bush*, June 3, 1888 (N. Y.); St. Louis, *Riehl 30*, June, 1838 (C.).

NORTH DAKOTA: Towner, McHenry County, *Lunell*, May 29, 1908, and June 12, 1913 (K. M.); Minot, Ward County, *Lunell*, July 7, 1907 (K. M., N. Y.); Ward County, *Haigh 224*, 1900 (N. Y.), June 24, 1908 (N. Y.).

SOUTH DAKOTA: Rosebud Creek, *E. J. Wallace*, July 2, 1896, type of *C. millegrana* Holm (K. M., N. Y.); Brookings, *Williams & Carter*, June 19, 1897 (K. M.); Sylvan Lake, Black Hills, *Rydberg 1085*, June, 1892 (N. Y.); Brookings, *Carter*, June 10, 1897 (N. Y.).

NEBRASKA: Ashland, *Williams*, May 1890 (K. M., N. Y.); Fort Niobrara, *Wilcox*, May, 1888 (C.).

KANSAS: Manhattan, May 16, 1889 (C.); Riley County, *Norton 553*, May 23, 1895 (N. Y.); Osborne City, *Shear 51*, May 26, 1894 (C.); Wichita, *Carleton*, May 9, 1888 (C.).

OKLAHOMA: Sapulpa, *Bush 1070*, May 2, 1895 (C.).

COLORADO: Fort Collins, *Marshall 2534*, June 12, 1899 (N. Y.); Fort Collins, *State Agr. Col. 2570*, June 7, 1898 (N. Y.).

TEXAS: Llano County, *Reverchon 1407*, May 1885 (K. M., N. Y.); Upper Rio Grande, *Bigelow*, Mexican Boundary Survey, duplicate of type (C.).